

## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 39**

**[Docket No. 98-ANE-38-AD; Amendment 39-12790; AD 2002-13-03]**

**RIN 2120-AA64**

#### **Airworthiness Directives; CFM International (CFMI) CFM56-2, -2A, -2B, -3, -3B, -3C, -5, -5B, -5C, and -7B Series Turbofan Engines**

**AGENCY:** Federal Aviation Administration, DOT.

**ACTION:** Final rule.

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**SUMMARY:** This amendment supersedes an existing airworthiness directive (AD), that is applicable to certain CFM International (CFMI) CFM56 series turbofan engines. That AD currently requires revisions to the Airworthiness Limitations Section of applicable Engine Shop Manuals (ESM's) to include required enhanced inspection of selected critical life-limited parts at each piece-part exposure. This amendment requires revisions to the Airworthiness Limitations Section of the applicable manufacturer's manuals and air carrier's approved continuous airworthiness maintenance program to incorporate additional inspections of selected critical life-limited parts at each piece-part exposure. This amendment is prompted by an FAA study of in-service events involving uncontained failures of critical rotating parts. The actions specified by this AD are intended to prevent critical life-limited rotating engine part failure, which could result in an uncontained engine failure and damage to the airplane.

**DATES:** Effective date August 1, 2002.

**ADDRESSES:** Information regarding this action may be examined, by appointment, at the Federal Aviation Administration (FAA), New England Region, Office of the Regional Counsel, 12 New England Executive Park, Burlington, MA.

**FOR FURTHER INFORMATION CONTACT:** Diane Cook, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803-5299; telephone (781) 238-7133, fax (781) 238-7199.

**SUPPLEMENTARY INFORMATION:** A proposal to amend part 39 of the Federal Aviation Regulations (14 CFR part 39) by superseding AD 2000-12-01, Amendment 39-11779 (65 FR 37031, June 13, 2000), which is applicable to certain CFMI CFM56 series turbofan engines, was published in the Federal Register on October 5, 2001, (66 FR 50910). That action proposed to modify the airworthiness limitations section of the manufacturer's manual and an air carrier's approved continuous airworthiness maintenance program to incorporate additional inspection requirements.

## **Comments**

Interested persons have been afforded an opportunity to participate in the making of this amendment. Due consideration has been given to the comments received.

## **Typographical Errors**

Four commenters requested typographical errors be corrected in the Mandatory Inspections Table as follows:

- For HPT Disk, change Engine Manual Section from 75-72-02 to 75-52-02.
- For HPC Rear (CDP) Air Seal, change Engine Manual Section from 72-52-03 to 72-31-08.
- For LPT Stub Shaft, change Engine Models from All to -2, -2A, -2B, -3, -3B, and -3C.
- For LPT Stub Shaft, change Engine Manual Section from 72-52-03 to 72-55-02.
- For LPT Shaft, change Inspection from FPI to MPI.

The FAA agrees and has corrected these typographical errors in the final rule.

## **Concern for Lead Time**

One commenter is concerned that for operators to put procedures and tooling in place in time to comply with the AD, the manufacturer should release the Engine Manual time limit and procedural changes by Temporary Revision before the issuance of the AD, or, revise the AD compliance time to state compliance to be within 30 days after the issuance of the Engine Manual revision (or Temporary Revision).

The FAA understands the commenter's concern. The FAA is aware that the manufacturer has not yet issued Temporary Revisions to the Engine Manual time limits section. However, the existing AD and this final rule allow the manufacturer up to 30 days after the effective date of the AD to issue the necessary revisions to the time limits section. Therefore, no action is necessary to address the commenter's observation.

## **Question on Model Effectivity**

One commenter asks why the proposed rule does not affect the various models of the CFM56-5A engine. The FAA understands that the commenter is referring to the CFM56-5-A engine in the proposed rule and in the final rule that is an engine subset covered under the -5 series. The -5 series is listed in the Applicability section, and therefore, the CFM56-5-A engine is included in the applicability of this AD.

After careful review of the available data, including the comments noted above, the FAA has determined that air safety and the public interest require the adoption of the rule with the changes described previously. The FAA has determined that these changes will neither increase the economic burden on any operator nor increase the scope of the AD.

## **Economic Analysis**

The FAA estimates that 5,100 CFM56 engines installed on airplanes of US registry would be affected by this AD and that there are approximately 2,300 piece part annual inspections that would be required. It would take approximately 2,775 work hours to do these inspections. The average labor rate is \$60 per work hour. The total estimated annual cost of the new inspections on US operators is expected to be approximately \$166,500.

## **Regulatory Analysis**

This final rule does not have federalism implications, as defined in Executive Order 13132, because it would not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Accordingly, the FAA has not consulted with state authorities prior to publication of this final rule.

For the reasons discussed above, I certify that this action (1) is not a "significant regulatory action" under Executive Order 12866; (2) is not a "significant rule" under the DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979); and (3) if promulgated, will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. A final evaluation has been prepared for this action and it is contained in the Rules Docket. A copy of it may be obtained by contacting the Rules Docket at the location provided under the caption ADDRESSES.

## **List of Subjects in 14 CFR Part 39**

Air transportation, Aircraft, Aviation safety, Safety.

## **Adoption of the Amendment**

Accordingly, pursuant to the authority delegated to me by the Administrator, the Federal Aviation Administration amends part 39 of the Federal Aviation Regulations (14 CFR part 39) as follows:

### **PART 39—AIRWORTHINESS DIRECTIVES**

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

#### **Sec. 39.13 [Amended]**

2. Section 39.13 is amended by removing Amendment 39-11779 (65 FR 3731, June 13, 2000), and by adding a new airworthiness directive, Amendment 39-12790, to read as follows:

# AIRWORTHINESS DIRECTIVE



Aircraft Certification Service  
Washington, DC

U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

*We post ADs on the internet at "[www.airweb.faa.gov/rgl](http://www.airweb.faa.gov/rgl)"*

The following Airworthiness Directive issued by the Federal Aviation Administration in accordance with the provisions of Title 14 of the Code of Federal Regulations (14 CFR) part 39, applies to an aircraft model of which our records indicate you may be the registered owner. Airworthiness Directives affect aviation safety and are regulations which require immediate attention. You are cautioned that no person may operate an aircraft to which an Airworthiness Directive applies, except in accordance with the requirements of the Airworthiness Directive (reference 14 CFR part 39, subpart 39.3).

**2002-13-03 CFM International:** Amendment 39-12790. Docket No. 98-ANE-38-AD. Supersedes AD 2000-12-01, Amendment 39-11779.

## Applicability

This airworthiness directive (AD) is applicable to CFM International (CFMI) CFM56-2, -2A, -2B, -3, -3B, -3C, -5, -5B, -5C, and -7B series turbofan engines, installed on but not limited to McDonnell Douglas DC-8 series, Boeing 737 series, Airbus Industrie A319, A320, A321, and A340 series, as well as Boeing C-135, E-3, E-6, KC-135, KE-3, and RC-135 (military) series airplanes.

**Note 1:** This AD applies to each engine identified in the preceding applicability provision, regardless of whether it has been modified, altered, or repaired in the area subject to the requirements of this AD. For engines that have been modified, altered, or repaired so that the performance of the requirements of this AD is affected, the owner/operator must request approval for an alternative method of compliance in accordance with paragraph (c) of this AD. The request should include an assessment of the effect of the modification, alteration, or repair on the unsafe condition addressed by this AD; and, if the unsafe condition has not been eliminated, the request should include specific proposed actions to address it.

## Compliance

Compliance with this AD is required as indicated, unless already accomplished.

To prevent critical life-limited rotating engine part failure, which could result in an uncontained engine failure and damage to the airplane, accomplish the following:

## Inspections

(a) Within the next 30 days after the effective date of this AD, revise the Airworthiness Limitations Section (chapter 05-00-00) of Engine Shop Manual (ESM) CFMI-TP.SM.4, for CFM56-2 series engines, ESM CFMI-TP.SM.6, for CFM56-2A/-2B series engines, ESM CFMI-TP.SM.5, for CFM56-3/-3B/-3C series engines, ESM CFMI-TP.SM.7 for CFM56-5 series engines, ESM CFMI-TP.SM.9 for CFM56-5B series engines, ESM CFMI-TP.SM.8 for CFM56-5C series engines, and ESM CFMI-TP.SM.10 for CFM56-7B series engines, and for air carrier operations, revise the approved continuous airworthiness maintenance program, by adding the following:

### "MANDATORY INSPECTIONS

(1) Perform inspections of the following parts at each piece-part opportunity in accordance with the Inspection/Check section instructions provided in the applicable manual sections listed below:

<b>Engine models</b>	<b>Part name</b>	<b>Engine manual section</b>	<b>Inspection</b>
All Models	Fan Disk (All Part Numbers (P/N))	72-21-03	Disk Fluorescent Penetrant Inspection (FPI) and Disk Bore and Dovetail Eddy Current Inspection (ECI).
All Models	Fan Shaft (All P/N)	72-22-01	Magnetic Particle Inspection (MPI).
CFM56-2, -2A, -2B, -3, -3B, and -3C.	HPT Disk (All P/N)	72-52-02	FPI, Disk Bore ECI and Disk Rim Bolt Hole(s) ECI.
CFM56-5, -5B, -5C, and -7B	HPT Disk (All P/N)	72-52-02	FPI, Disk Bore ECI.
CFM56-2	HPT Front Rotating Air Seal (All P/N)	72-52-03	FPI, Seal Bore ECI and Bolt Hole(s) or Focused FPI as applicable.
CFM56-2A, -2B, -3, -3B, and -3C.	HPT Front Rotating Air Seal (All P/N)	72-52-03	FPI, Seal Bore ECI and Bolt Hole(s) ECI.
CFM56-5, -5B, -5C, and -7B	HPT Front Rotating Air Seal (All P/N)	72-52-03	FPI, Seal Bore ECI and Bolt Hole(s) Focused FPI.
All Models	HPC Stage 1-2 Spool (All P/N)	72-31-04	FPI.
All Models	HPC Stage 3 Disk (All P/N)	72-31-05	FPI.
All Models	HPC Stage 4-9 Spool (All P/N)	72-31-06	FPI.
All Models	HPC Front Shaft (All P/N)	72-31-07	FPI.
All Models	HPC Rear (CDP) Air Seal (All P/N)	72-31-08	FPI.
All Models	LPT Stage 1 Disk (All P/N)	72-54-03	FPI.
All Models	LPT Stage 2 Disk (All P/N)	72-54-03	FPI.
All Models	LPT Stage 3 Disk (All P/N)	72-54-03	FPI.
All Models	LPT Stage 4 Disk (All P/N)	72-54-03	FPI.
CFM56-5C.	LPT Stage 5 Disk (All P/N)	72-54-03	FPI.
All Models	LPT Rotor Support (All P/N)	72-54-05	FPI.
All Models	LPT Shaft (All P/N)	72-55-01	MPI.
CFM56-2, -2A, -2B, -3, -3B and -3C.	LPT Stub Shaft (All P/N)	72-55-02	FPI.

(2) For the purposes of these mandatory inspections, piece-part opportunity means:

(i) The part is considered completely disassembled when accomplished in accordance with the disassembly instructions in the manufacturer's engine manual; and

(ii) The part has accumulated more than 100 cycles in service since the last piece-part opportunity inspection, provided that the part was not damaged or related to the cause for its removal from the engine."

(b) Except as provided in paragraph (c) of this AD, and notwithstanding contrary provisions in Sec. 43.16 of the Federal Aviation Regulations (14 CFR 43.16), these mandatory inspections must be performed only in accordance with the Time Limits section of the manufacturer's ESM.

## **Alternative Methods of Compliance**

(c) An alternative method of compliance or adjustment of the compliance time that provides an acceptable level of safety may be used if approved by the Manager, Engine Certification Office. Operators must submit their request through an appropriate FAA Principal Maintenance Inspector, who may add comments and then send it to the Manager, Engine Certification Office.

**Note 2:** Information concerning the existence of approved alternative methods of compliance with this airworthiness directive, if any, may be obtained from the Engine Certification Office.

## **Special Flight Permits**

(d) Special flight permits may be issued in accordance with Secs. 21.197 and 21.199 of the Federal Aviation Regulations (14 CFR 21.197 and 21.199) to operate the airplane to a location where the requirements of this AD can be accomplished.

## **Continuous Airworthiness Maintenance Program**

(e) FAA-certificated air carriers that have an approved continuous airworthiness maintenance program in accordance with the record keeping requirement of Sec. 121.369(c) of the Federal Aviation Regulations (14 CFR 121.369(c)) of this chapter must maintain records of the mandatory inspections that result from revising the Airworthiness Limitations Section of the applicable ESM and the air carrier's continuous airworthiness program. Alternatively, certificated air carriers may establish an approved system of record retention that provides a method for preservation and retrieval of the maintenance records that include the inspections resulting from this AD, and include the policy and procedures for implementing this alternate method in the air carrier's maintenance manual required by Sec. 121.369(c) of the Federal Aviation Regulations (14 CFR 121.369 (c)); however, the alternate system must be accepted by the appropriate PMI and require the maintenance records be maintained either indefinitely or until the work is repeated. Records of the piece-part inspections are not required under Sec. 121.380(a)(2)(vi) of the Federal Aviation Regulations (14 CFR 121.380(a)(2)(vi)). All other operators must maintain the records of mandatory inspections required by the applicable regulations governing their operations.

**Note 3:** The requirements of this AD have been met when the ESM changes are made and air carriers have modified their continuous airworthiness maintenance plans to reflect the requirements in the applicable ESM.

## **Effective Date**

(f) This amendment becomes effective on August 1, 2002.

Issued in Burlington, Massachusetts, on June 17, 2002.  
Jay J. Pardee,  
Manager, Engine and Propeller Directorate, Aircraft Certification Service.  
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